May 10, 1960 W. B. McLEAN 2,935,950

RELEASE MECHANISM

Filed May 13, 1944

FIG. 1

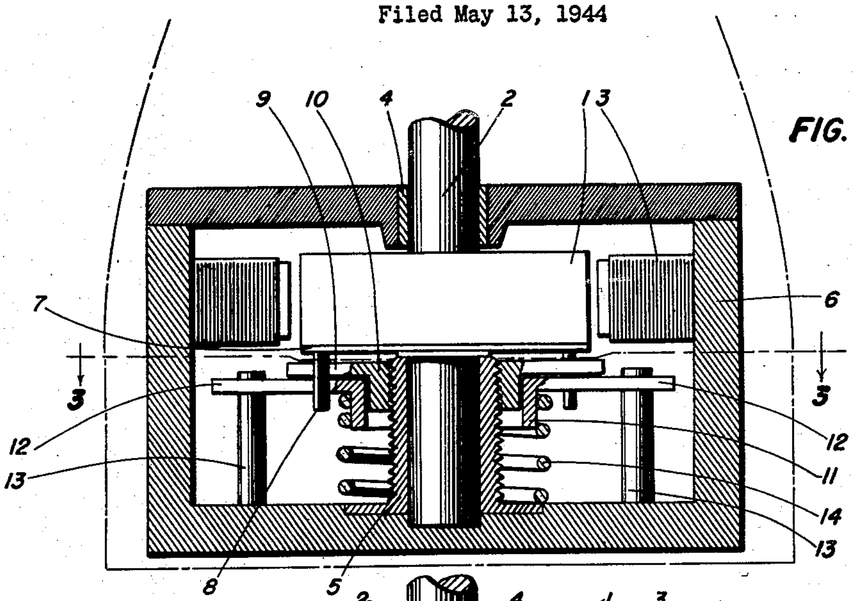


FIG. 2

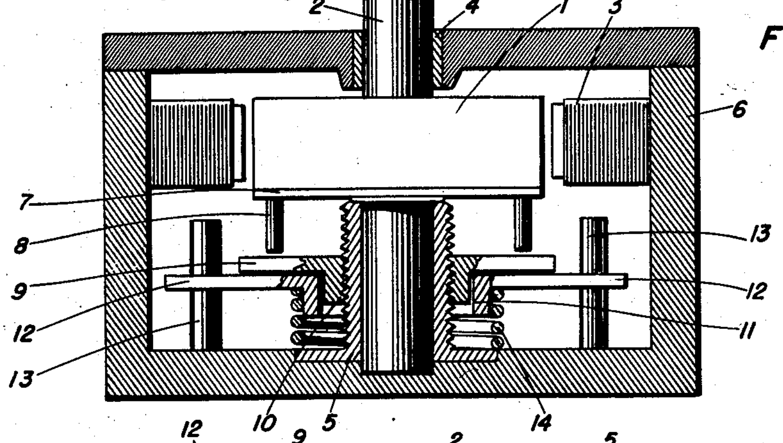
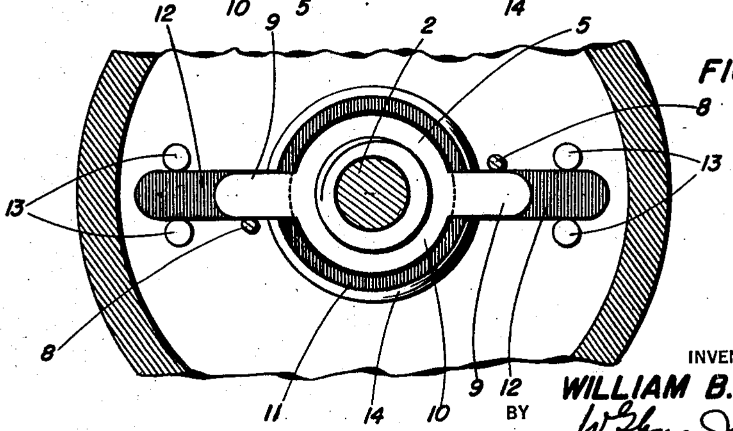


FIG. 3



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United States Patent Office

2,935,950

Patented May 10, 1960

2,935,950

RELEASE MECHANISM

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Application May 13, 1944, Serial No. 535,527

6 Claims. (Cl. 102—70.2)

(Granted under Title 35, U.S. Code (1952), sec. 266)

This invention relates to electric generators and accessory apparatus therefor, particularly for use in fuzes.

A primary object of the invention is to provide an improved setback operated lock, so arranged as normally to prevent the rotor of a generator from revolving, but which is released when the generator as a whole is rapidly accelerated, as in a projectile in which the generator is mounted.

Another object is to provide such a generator latch of simple construction, adapted to prevent the rotor from turning until after setback and which cannot be released by accelerations of short duration.

Another object is to provide a generator lock which, when released, is positively secured in such manner that it cannot again interfere with rotation of the generator rotor.

Other objects will be apparent upon consideration of the present disclosure in its entirety.

In the drawings:

Fig. 1 is a part-sectional diametric elevational view of a generator and a housing therefor, showing my improved setback-operated mechanism in locked position.

Fig. 2 is a view similar to Fig. 1 but showing the locking mechanism released.

Fig. 3 is a cross section taken substantially on the line 3—3 of Fig. 1, and looking in the direction of the arrows.

Referring now to the drawings, rotor **1** is fastened to shaft **2**, which may be driven by any suitable means (not shown but which may comprise a wind-driven impeller). Field coils **3**, shown diagrammatically, are mounted in casing **6** in operative relationship to the rotor. Shaft **2** rotates in bearings **4** and **5** fixed in casing **6**. Disc **7** is screwed or otherwise fastened to the lower face of rotor **1**, and carries pins **8** positioned as best shown in plan in Fig. 3. Pins **8** normally extend downwardly beside arms **9**, **12**. Arms **9** are integral with a tapped cylindrical hub **10**, threaded upon the axial bushing **5** upstanding from the bottom of the casing and which forms the lower bearing for the rotor. An additional hub **11** is downwardly slidable on the outside surface of hub **10** and carries arms **12** which normally block pins **8** and therefore prevent rotor **1** from being turned. Arms **12** are vertically slidable between and prevented from rotating by posts **13** fixed to the bottom of casing **6**. Compression spring **14** urges the arm and hub assembly **11**, **12** upwardly.

It will be understood that the generator and its release mechanism are installed in the projectile or other vehicle with the axis of shaft **2** parallel to the line of flight.

When the projectile in which my improved generator release mechanism is contained is fired, arms **12** and hub **11** are in effect moved downward under the force of set-back, compressing spring **14**. This action brings locking arms **12** below pins **8** which are then rapidly revolved with rotor **1** by the driving means (unshown) attached to shaft **2**. The direction of such rotation is such as to screw sleeve **10** down on the sleeve **5**. The momentum of the nut assembly **9**, **10**, in conjunction with reverse acceleration, is sufficient to insure that arms **9** will be carried below the ends of pins **8**. Rotor **1** is thus left free to revolve under the influence of its driving means.

When the setback ceases, arms **12** remain fastened in their depressed, releasing position, being held securely against the pressure of spring **14** by means of the nut assembly **9**, **10**.

It is, of course, essential that setback endure for a sufficient period to let the propeller turn enough revolutions to spin arms **9** down below the pins **8**. It has been found that this action is easily attainable with projectiles and generator driving means of known varieties.

The generator is therefore positively locked until the projectile is fired, and released with equal positiveness upon firing.

The invention herein described may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

I claim:

1. An electrical generator having rotor and stator means adapted for installation in a projectile or the like, set-back releasable locking means for said rotor including a detent normally in operative blocking engagement with said rotor but movable away from such engagement under the influence of set-back, spring means for urging said detent in such operative blocking engagement, means for holding said detent out of such blocking engagement, and means for rotating said rotor relative to said stator substantially immediately upon release of said rotor by said releasable locking means.

2. An electrical generator having rotor and stator means adapted for installation in a projectile or the like, set-back releasable locking means for said rotor including a detent normally in operative blocking engagement with said rotor but movable away from such engagement under the influence of set-back, means for holding said detent out of such blocking engagement, said electrical generator being adapted for installation in a projectile with the axis of rotation of the rotor substantially parallel to the line of flight of the projectile, said locking means including a spring-held mass movable rearwardly with respect to the direction of flight during set-back, and said holding means including a hold-down nut actuatable by the rotor.

3. An electrical generator having rotor and stator means adapted for installation in a projectile or the like, set-back releasable locking means for said rotor including a detent normally in operative blocking engagement with said rotor but movable away from such engagement under the influence of set-back, means for holding said detent out of such blocking engagement, said generator including a shaft supporting said rotor concentric with said stator means, the said stator means being adapted for installation in a projectile with the shaft substantially parallel to the line of flight of the projectile, said detent including a mass mounted concentrically with respect to and movable longitudinally of the shaft, spring means surrounding the shaft and urging said mass toward the rotor, and interengageable abutment portions carried by said rotor and mass and separable when said detent moves away.

4. An electrical generator having rotor and stator means adapted for installation in a projectile or the like, set-back releasable locking means for said rotor including a detent normally in operative blocking engagement with said rotor but movable away from such engagement under the influence of set-back, means for holding said detent out of such blocking engagement, said generator

including a shaft supporting said rotor concentric with said stator means, the said stator means being adapted for installation in a projectile with the shaft substantially parallel to the line of flight of the projectile, said detent including a mass mounted concentrically with respect to and movable longitudinally of the shaft, spring means surrounding the shaft and urging said mass toward the rotor, interengageable abutment portions carried by said rotor and mass and separable when said detent moves away, said holding means including a hold-down nut also surrounding the shaft and drivable by the rotor, after release of said locking means, to a position in which it prevents reengagement of said abutment portions.

5. An electrical generator having rotor and stator means adapted for installation in a projectile or the like, set-back releasable locking means for said rotor including a detent normally in operative blocking engagement with said rotor but movable away from such engagement under the influence of set-back, means for holding said detent out of such blocking engagement, said generator including a shaft supporting said rotor concentric with said stator means, the said stator means being adapted for installation in a projectile with the shaft substantially parallel to the line of flight of the projectile, said detent including a mass mounted concentrically with respect to and movable longitudinally of the shaft, spring means surrounding the shaft and urging said mass toward the rotor, interengageable abutment portions carried by said rotor and mass and separable when said detent moves away, said holding means including a hold-down nut also surrounding said shaft and drivable by the rotor, after release of said locking means, to a position in which it prevents reengagement of said abutment portions, said nut being arranged between the mass and the rotor and being of sufficient mass to coast to and hold the mass in a position in which said abutment portions are clear of one another.

6. An electrical generator having rotor and stator means adapted for installation in a projectile or the like, set-back releasable locking means for said rotor including a detent normally in operative blocking engagement with said rotor but movable away from such engagement under the influence of set-back, means for holding said detent out of such blocking engagement, said generator including a shaft supporting said rotor concentric with said stator means, the said stator means being adapted for installation in a projectile with the shaft substantially parallel to the line of flight of the projectile, said detent including a mass mounted concentrically with respect to and movable longitudinally of the shaft, spring means surrounding the shaft and urging said mass toward the rotor, pins projecting longitudinally from the rotor and into driving engagement with said mass, said holding means including a hold-down nut also surrounding said shaft and engageable with and adapted to be driven by said pins, said nut being movable by said pins to a position in which it prevents reengagement of said mass with the pins.

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